SOME OBSERVATIONS ON THE HABITS OF *PAROPLITES AUSTRALIS* (ERICHSON) (COLEOPTERA: CERAMBYCIDAE, PRIONINAE) AND ITS DAMAGING EFFECTS ON THE FOOD PLANT *BANKSIA MARGINATA* CAV. IN TASMANIA

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Abstract

The nocturnal behaviour of *Paroplites australis* (Erichson) is discussed as well as size range and sex ratio. Particular attention is given to the damaging effects that the larvae and emerging adults have on adult plants of *Banksia marginata* Cav.

Introduction

Paroplites australis (Erichson) is common and widespread in Tasmania, with greatest abundance in coastal areas where *Banksia marginata* Cav. is most common. Erichson (1842), Froggatt (1907, 1923) and McKeown (1947) record *P. australis* from Tasmania while Duffy (1963) records it from Queensland to Victoria. Specimens in the collections of the Queen Victoria Museum, Launceston have been collected on Flinders and Cape Barren Islands in the Furneaux Group.

Food plants

Froggatt (1923) lists *Banksia serrata* L.f. as the main food plant for *P. australis* but goes on to discuss damage caused to ornamental trees by this species. He lists *Quercus* L. (oak), *Ulmus* L. (elm) and *Salix* L. (willow) as being infested by *P. australis*, to which Duffy (1963) adds *Banksia integrifolia* L.f., *Casuarina* L. and *Eucalyptus pilularis* Sm. McKeown (1947) also lists *Banksia integrifolia*.

In Tasmania the main larval food plant is *Banksia marginata* but the she-oak, *Casuarina stricta* Ait. is also attacked. Both these food plants are recorded here for the first time.

The study site

This study was undertaken in 11 hectares of dry woodland on the property of Mr and Mrs L.B. Walker on the outskirts of Longford, some 40 km from Launceston. The site is the last remaining stand of *Eucalyptus pauciflora* Sieb. ex Spreng. in the area and has remained in this condition since the beginning of the century. *Acacia mearnsii* De Wild, *Banksia marginata* and the introduced hawthorn, *Crataegus monogyna* Jacq., form the understorey. Sheep have been grazing in the area for irregular but extended periods since 1900 and so there is a complete absence of native tree saplings. There are no reasonably young specimens of *Eucalyptus pauciflora* and only three young specimens of *Banksia marginata* and most *Acacia mearnsii* have grown up through clumps of the prickly *Crataegus monogyna* and were protected from grazing sheep.

The study site was visited each year between 1982 and 1986 (except 1984) for collecting purposes and the abundance of the beetle and its host tree were noted.

Beetle emergence and abundance

The study site was first visited on January 23, 1982. A large *Banksia marginata* with a sizeable broken limb was noticed, exposing old larval bore and pupation chambers of *P. australis*. Some of the nearby banksias had fresh emergence holes in them. A male *P. australis* was found sheltering in an old emergence hole, so it must have sheltered there from the night before. The tree with the broken limb was then cut into, and several teneral specimens were removed from their pupal chambers.

The night of the 23rd was warm and overcast with a slight breeze. At 11:30 p.m. trunks of banksias were checked with a torch and a number of males were collected.

The following day (24th) fresh emergence holes were checked with a torch, revealing many beetles still within their pupal chambers. Adult beetles chew away the bark over their emergence holes and then await suitable weather conditions before emerging. The night of the 24th was cold, windy and showery and no beetles were found on the trees.

The next night (25th) was warm, overcast with no wind. At 11:30 p.m. the banksias were once again checked and 20 beetles (19 males, 1 female) were taken from the trunks or main branches, up to 4 m off the ground. Several specimens, including the female were taken on a large healthy banksia with no emergence holes in it. From what I can gather, the beetles emerge, climb 4 m or so up the tree and then fly off; males in search of mates and females in search of oviposition sites. This is indicated by the presence of both sexes on an untouched tree. Mating was not observed.

On the 26th, a large, nearly dead *Banksia marginata* was discovered. It had no emergence holes and because it was dying I suspected that it might contain beetles still within their pupal chambers. The bark was peeled off the trunk to a height of about 2 m, exposing numerous emergence holes, some at ground level, still sealed with flakes of wood. A total of 4 females and 11 males were taken from pupal chambers in this tree. In other trees emergence holes were observed in exposed roots near the trunk and in thinner branches some 4 m above the ground.

This tree was obviously dying because of the destructive boring activities of *P. australis* larvae. Much of its interior consisted of frass and large pieces of wood just under 1 m long could be prised off easily with an axe. Many larvae of several sizes were present.

Over the three days a total of 49 beetles (41 males, 8 females) were captured. Fifteen of the males were taken from pupal chambers and the other 26 from tree trunks at night. All but one of the females were taken from pupal chambers.

P. australis varies enormously in size, especially in the males, the largest specimen captured was a 53 mm long and 21 mm wide male. The smallest specimen, also a male, was 27 mm long and 10 mm wide, whilst the largest female was 50 mm long and 20 mm wide.

The study area was again visited on the 24th of January, 1983. Very few fresh emergence holes were seen and only one beetle, a large female, was cut from its pupal chamber. Mr A. Walker observed very little adult activity after this date.

This site was not again visited until the 7th and 17th of February, 1985. Nine males and 6 females were taken, of which 5 of the males and all the females were recovered from the pupal chambers in a dead tree. The other 4 males, all very small, were found under sheets of cardboard nailed to a living tree earlier in the summer. Very few fresh emergence holes were observed.

The site was again visited on the 16th of February 1986 when very few fresh emergence holes were found and only 2 dead males were collected at the base of a tree.

The decline of the food plant

When the area was first visited in January, 1982 there were 15 living specimens of *Banksia marginata* and one that had recently died as well as 35 banksia stumps and logs that had died before 1982. All the old stumps and logs were riddled with pupal chambers and emergence holes.

In 1983 several of the trees had suffered wind damage, revealing severe infestation. One tree in particular showed no external damage but a break revealed larval infestation. By 1985 only 7 trees remained alive, of which 3 were young trees (trunk diameter <30 cm) and showed no external signs of infestation while the remainder were large and had emergence holes.

When visited in 1986, another large tree had died and those that died earlier had blown over revealing interiors mainly of frass.

The conclusion is that larvae of *P. australis* are a major contributing factor to the rapid death of large adult banksias (especially trees with a trunk diameter of 1 m or more) by consuming the wood and thus making the tree very susceptible to wind damage. Emergence holes let in moisture and other borers, promoting further decay.

Froggatt (1923) reported that *P. australis* brings about the rapid decline of banksias. He states: 'It is responsible for the final

destruction of a great number of the honeysuckle trees, particularly *Banksia serrata*.' The rapid decline of *Banksia marginata* coupled with no regrowth due to grazing by sheep may mean both the beetle and its host vanish from this area in a short time. Each year the number of trees diminishes as does the number and size of the beetles. All beetles taken from dead banksias were considerably underdeveloped compared to those from living trees. In other areas of Tasmania the decline of large adult banksias due to damage by *P. australis* is counteracted by sapling regrowth. The largest specimens of *Banksia marginata* occur in areas where *P. australis* is absent.

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